REMARKS

New Claims 30-49 are added. New Claims 30-49 ultimately depend from independent Claim 4. The new claims contain the features found in withdrawn Claims 9-28. The Applicants respectfully submit that no new matter has been added. It is believed that this Amendment is fully responsive to the Office Action dated January 11, 2010

CLAIM REJECTION UNDER 35 U.S.C. §103:

In the Office Action, Claims 4-8 were rejected under 35 U.S.C. §103(a) as being unpatentable over Barney et al. (U.S. Publication 2002/0110180 in view of Petruska et al. (U.S. Patent No. 7,226,953). Reconsideration and removal of this rejection are respectfully requested in view of the following remarks.

The Office Action alleges that Barney et al. teaches a composition that includes a matrix composition and semiconductor nanocrystals exhibiting fluorescence, wherein the nanocrystals have a particle size in the range from 1.5-12.5 nm and a fluorescence quantum yield of 3% or greater; the semiconductor nanocrystals are disposed in an inorganic matrix such as a sol-gel derived matrix, wherein a suitable precursors for such a matrix includes hydrolysable compositions including silicon alkoxide ($Si(OR)_4$).

The Office Action admits that Barney et al. fails to teach functionally modified triethoxy silane as a sol-gel precursor, but alleges that Petruska et al. teaches that the loading amount in sol-gel glasses can be optimized by a ligand exchange process on the semiconductor particles. After this

ligand exchange, the semiconductor is passivated and functionalized to interact with the host matrix (a different material than the solid matrix). Based on the minimum QD size taught by Barney, this leads to a maximum molarity of 1.69 mol/l ((vol of QD/vol of individual QD)/(Avogadro's number)) of the quantum dots. This high loading as stated before is accomplished by a ligand exchange of the semiconductor particles wherein, the ligands on the particles are substituted with a ligand having the formula X-Z-Y, wherein X includes among others amino groups, Z is a carbonaceous group including alkyl, and aryl (phenyl), and alkylaryl groups, wherein the units repeat from 1 to 20 times, and finally Y is a functional group to interact with the silane compound, which is chosen from a group comprising hydroxyl, carboxylic, and alkoxysilane groups. Using the above ligands in conjunction with the silicon alkoxides of Barney et al. forms a sol-gel glass of the same composition as that claimed. It is noted that the use of the modified trialkoxy silanes is a product by process claim. The use of the above mentioned ligands would result in a sol-gel glass of the same chemical structure as the sol-gel glass claimed. Although there are differences in the process of making the glass, the final product is essentially the same. Therefore, the combination of Barney et al. in view of Petruska et al. results in a sol-gel glass comprising the product of said organoalkyoxysilanes claimed. As is shown in the figure, the values associated with n range are from 1-3 as claimed.

It is respectfully submitted that the present application is the national phase application of WO 2004/000971 that has a filing date of May 6, 2003 which is prior to November 17, 2003, the filing date of Petruska. Thus it is respectfully submitted that Petruska can not properly be used as a prior art reference in the present application.

Regarding the cited reference Barney et al., on page 3, lines 8-10 of the Office Action, it states that "it is stated that the quantum efficiency of the nanocrystals used can be greater than 20% and even greater than 80% (see paragraph 18)".

Paragraph [0018] of Barney discloses that the fluorescent material can have emission quantum efficiencies (corresponding to the fluorescence quantum yield in the present invention) greater than 10%, 20%, 30%, 40%, 50%, 60%, 70%, or 80%. However, these values are considered the fluorescence quantum yields of ultra-fine particles themselves. The fluorescence quantum yields of semiconductor ultra-fine particles dispersed in a sold matrix are not described. Further, in the Examples of Barney, neither the fluorescence quantum yields of ultra-fine particles in the solution nor those of ultra-fine particles in the fluorescent material were examined.

Generally, it is difficult to disperse semiconductor ultra-fine particles in a solid matrix while maintaining the fluorescence quantum yields thereof. However, Barney does not recognize the difficulty of dispersing semiconductor ultra-fine particles in a solid matrix while maintaining the fluorescence quantum yields thereof.

Therefore, it is respectfully submitted that Barney fails to teach or suggest the fluorescence quantum yield of semiconductor ultra-fine particles dispersed in a solid matrix.

On page 3, lines 10-14 of the Office Action, it states that "Barney goes on to state that the matrix in which the semiconductor nanocrystals are disposed can be an inorganic matrix such as a sol-gel derived matrix (see paragraph 30)" and that "Barney then gives suitable precursors for such a matrix including hydrolysable compositions including silicon dioxide ($Si(OR)_4$) (see paragraph

32)".

However, on page 3, line 15 of the Office Action it states that Barney fails to teach functionally modified trialkoxy silane as a sol-gel precursor.

In view of the above remarks, removal of this rejection is respectfully requested.

In the Office Action, Claims 4-8 were provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over Claims 6-7 copending Application No. 10/543,185. Accordingly, attached herewith is a Terminal Disclaimer in order to overcome this rejection.

In view of the above remarks, Claims 4-8 and 30-49 are believed to be patentable and in condition for allowance, which action, at an early date, is requested.

If, for any reason, it is felt that this application is not now in condition for allowance, the Examiner is requested to contact the Applicants' undersigned agent at the telephone number indicated below to arrange for an interview to expedite the disposition of this case.

In the event that this paper is not timely filed, the Applicants respectfully petition for an appropriate extension of time. Please charge any fees for such an extension of time and any other fees which may be due with respect to this paper, to Deposit Account No. 01-2340.

Respectfully submitted,

KRATZ, QUINTOS & HANSON, LLP

James N. Baker
Agent for Applicant
Reg. No. 40,899

JNB/ak

Atty. Docket No. **080308**
Suite 400
1420 K Street, N.W.
Washington, D.C. 20005
(202) 659-2930

23850
PATENT & TRADEMARK OFFICE

Enclosure: Terminal Disclaimer